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EXAMINER	
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ART UNIT	PAPER NUMBER
2621	5

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/940,432	MURATA ET AL.	
	Examiner	Art Unit	
	Dennis Rosario-Vasquez	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 August 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 August 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 2.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1,3,4,5,6,7,9,10,12,13,14,15,16 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakamura et al. (US Patent 6,005,987 A).

Regarding claims 1 and 9, Nakamura et al. et al discloses an image processing method and apparatus (Fig. 2 is the apparatus.) for correcting image distortions (Differences in angles and parallax between images are corrected for as mentioned in col. 4, lines 39-44.) caused by oblique imaging in which an original image of an object on an object plane is taken from different oblique directions to obtain a plurality of partially overlapping images, comprising:

a) a correspondence detecting unit (Fig. 2, num. 106:"PICTURE IMAGE POSITION CALCULATING UNIT" matches patterns with correlation values as mentioned in col. 12, lines 34-40.) determining a feature point ((rx0,ry0) of figure 9A is a feature point or reference point of brightness values as mentioned in col. 12, lines 50-55 and col. 13, lines 8,9.) of one of the plurality of partially overlapping images (Figure 9A has an image "I(k)" that is one of a plurality of images I(k) and I(k+1) for figures 9A and 9B,respectively, that has the feature point.) corresponding to a common location of the original image, shared by the plurality of partially overlapping images (The "common

location" in Nakamura is identified in figures 9A and 9B by the boxed areas R1 and BM.), and determining a matched point of one of the other partially overlapping images corresponding to the feature point (The point (mx0,my0) of one of the other partially overlapping images I(k+1) of fig. 9B is a matched point in a matching region BM that is matched with the reference point (rx0,ry0) in the reference region R1 of the image I(k) fig. 9A as mentioned in col. 12, lines 34-55.) so that a direction of the object plane is calculated based on the feature point and the matched point (The direction of the object plane shown in fig. 9B as the region BM is calculated by subdividing the object plane as shown by the squares BM in fig. 9E, matching each subdivision with another subdivision using the feature and matched points from which a vector direction Vm of fig. 9E can be determined as mentioned in col. 13, lines 14-47.)

b) a standard image setting unit (Figure 2, num. 108a:"JOINT LINE DETERMINING & PROCESSING UNIT" selects an image based on an optimum joint line as mentioned from col. 5, lines 58 to col. 6, line 13 and col. 22, lines 60-62.) selecting one of the plurality of partially overlapping images (The image of figure 13A is the one image selected either from a selection of images from figures 13A and 13B which correspond with the pairs of partially overlapping images of figure 9A and 9B. The image of figure 13A is selected because the image of figure 13A has an optimum line selected from images 13A and 13B as shown in figures 13A-C and mentioned from col. 5, line 58-col. 6, line 13 and col. 22, lines 34-62.) as a standard image whose image distortions are to be corrected (The standard image of figure 13A that was selected will

prevent parallax or doubling of objects as distortion when constructing a composite or panoramic image as mentioned in col. 24, lines 43-52); and

c) a distortion correcting unit generating a distortion-corrected image (Figure 2, num. 109:"PICTURE IMAGE COMPOSITION & PROCESSING UNIT" generates a composite image that is distortion-corrected.) on a projection plane (Fig. 11I,numerals 803 and 804 shows a panoramic or composite image as the projection plane or output picture image region as mentioned in col. 18, lines 42-45.) by projecting the standard image onto the projection plane (The standard image of figure 13A is also shown as the image in figure 11G that is projected on the projection plane 803 and 804.) based on the direction of the object plane such that image distortions in the standard image are eliminated (The direction of the object plane BM of figure 9E was corrected beforehand (col. 13, lines 14-47) starting with the process of 106 of figure 2 so that parallax can then be corrected using the standard image 13A in the later process 108a of figure 2. The process of figure 109a of figure 2 uses the results of processes 106 and 108a to generate a distortion-corrected image free from misalignment and parallax as mentioned in col. 4, lines 35-40.).

Regarding claims 3 and 12, Nakamura et al. discloses the image processing method according to claim 1 wherein in said selecting step, one of the plurality of partially overlapping images is automatically selected as the standard based on a direction of a straight-line pattern (A vertical direction of a straight-line pattern L1(k) is shown in the image of figure 13A that is selected as the image with the optimum joint line that is selected from other lines as mentioned in regarding claims 1 and 9, above.) contained in each image (Figure 13A and 13B both are images that contains lines: L1(k) and L2(k) for the image of figure 13A and L3(k) for the image of figure 13B.).

Regarding claims 4 and 13, Nakamura discloses the image processing method according to claim 1 wherein in said selecting step, one of the plurality of partially overlapping images is automatically selected as the standard (The image of figure 13A is automatically selected from the partially overlapping images using a computer program to execute the process of selecting a standard image as mentioned in col. 25, lines 59-64.) based on the feature point and the matched point (The standard image was selected using the processed result of the feature point (rx0,ry0) and matched point (mx0,my0) as shown by the series of procedures mentioned in col. 25, lines 59,60.) determined by said determining step.

Regarding claims 5 and 14, Nakamura discloses the image processing method according to claim 1, wherein in said selecting step, one of the plurality of partially overlapping images is automatically selected as the standard image (This portion was addressed in claim 4.) based on a calculated direction of the object plane for each of the partially overlapping images (The standard image of figure 13A was selected using the processed result of the calculated direction Vm of fig. 9E of the object plane BM of figure 9E as shown by the series of procedures mentioned in col. 25, lines 59,60.)

Claim 6 is similar to claim 1 except for the additional element taught by Nakamura et al. of:

Selecting one of the plurality of partially overlapping images as a standard image that contains a smallest amount of image distortions (The image I(k) of figure 11G which corresponds with the image of fig. 13A is selected as the standard image, because I(k) will prevent the least amount of parallax or object doubling using an optimum alignment or joining line (L sub. k) that was calculated by a minimizing function "a" out of all other joining lines from the plurality of partially overlapping images (Using figure 13A and 13B, L1(k),L2(k) and L3(k) are candidate joining lines within the respective plurality of overlapping images as mentioned in col. 22, lines 43-45 and line 51 shows the function "a". Note that the minimizing function "a" prevents parallax.) among the plurality of partially overlapping images (Figure 13A and 13B are a plurality of overlapping images.). Thus the image selected with the optimum joining line will prevent parallax or doubling of objects as distortion when constructing a composite or panoramic image as mentioned in col. 24, lines 43-52.

Claim 7 has similar claim language with claims 1, 6 and 9 and has been addressed in claims 1,6 and 9.

Regarding claim 10, figure 4 shows a plurality of imaging units or cameras 301 and 302 that obtains an image of a scene in different directions 303 and 304, respectively.

Claim 15 is similar to claim 1 except for the additional limitations which are discloses by Nakamura et al. of a computer-readable storage medium storing program code instructions for causing a computer to execute an image distortion correction processing (Nakamura et al. states, "The program stored in the storage medium is installed in the computer to cause the central processing unit to execute the program (col. 26, lines 23-25).") and code means (A series of program procedures or code means are mentioned from col. 25, line 59 to col. 26, line 15.), comprising:

a) first program code means for causing the computer to determine a feature point etc. (A first program procedure calculates a position of an image using points at col. 26, lines 5,6 and addressed in claim 1.) .

b) second program code means for causing the computer to select one of the plurality of partially overlapping images as a standard image whose distortions are to be corrected (A second program procedure sets "the joint line on the profile of the object closest to the imaging means of the picture image"... as mentioned in col. 26, line 10-13) ; and

c) third program code means for causing the computer to generate a distortion-corrected image (A third program procedure forms "a composite panoramic picture image from the divided picture images." as mentioned in col. 26, lines 14,15.).

Claim 16 has been addressed claims 1,6 and 15.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 2,8 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al.(US Patent 6,005,987 A) in view of Iijima et al. (US Patent 6,445,814 B2).

Regarding claims 2,8 and 11, Nakamura teaches selecting a standard image using three methods (Nakamura et al., col. 22, lines 17-62) and selects objects using an area as shown in figure 9B by the area BM in relation to another area BL, but does not teach the limitations of claims 2 and 8.

Regarding claims 2 and 11, Iijima et al. teaches in a selecting step, one of the plurality of partially overlapping images is automatically selected as the standard based on a ratio of an area of an object to an entire area of each image (A ratio between a background plane or entire area of each image as shown in fig. 2, num. 3 to an image sensing region or area of an object as shown in figure 2, num. 2 is used to select an

image from a plurality of images based on a reliability measure calculated from the ratio as mentioned in col. 22, lines 58-60 and col. 23, lines 36-40.).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the teaching of the standard image selection of Nakamura et al. with the teaching of Iijima et al.'s ratio, because Iijima et al's ratio provides a measure for "precisely obtain[ing] characteristic points (Iijima et al., col. 22, lines 54-60)."

Regarding claim 8, Iijima et al. teaches a standard image setting unit (Fig. 2, num. 11 is an operation unit or standard image setting unit that allows a user to view an object or standard image from an arbitrary view point as mentioned in col. 23, lines 59-67.) that is configured such that a user is required to select the standard image when taking the original image from one of the oblique directions (A user views the standard image or object from the arbitrary view point to determine whether the object needs more processing as mentioned in col. 23, lines 64-67.), and wherein said image processing apparatus further comprises a notification unit which notifies the user that the standard image is currently taken (A display fig. 2, num. 8 is notification unit that visually displays that standard image or object with reliability data as mentioned in col. 23, lines 61-64.)

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the teaching of the standard image selection of Nakamura et al. with the teaching of Iijima et al.'s user selection teaching, because Iijima et al.'s user selection teaching allows the user "at a glance" or quickly determine whether the standard image needs further processing as mentioned in col. 23, lines 64-67.

Double Patenting

5. Claims 1,6,7,9,15 and 16 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 4, 11 and 18 of copending Application No. 09/645,511 in view of Nakamura et al. (US Patent 6,005,987 A)

Regarding claim 1 of the instant application, the copending application 09/645,511 teaches in claim 4 all the limitations of claim 1 of the instant application except for the step of selecting.

However, the copending application of claim 4, lines 15,16 does suggest projecting one of two images in the step of generating.

Nakamura et al. does teach selecting one of the plurality of partially overlapping images as a standard image whose image distortions are to be corrected. Nakamura selects one image (The image of fig. 13A) from a plurality (The images from fig. 13A and 13B) that are overlapping images as a standard image because the selected image will provide correction of parallax as mentioned in col. 24, lines 40-52. Note that the selected image is selected based on an optimum joint line selected from candidate lines within the images of figure 13A and 13B as mentioned in col. 22, lines 34-62.)

Regarding claim 6 of the instant application, the copending application 09/645,511 teaches in claim 4 all the limitations of claim 6 of the instant application except for the step of selecting.

However, the copending application of claim 4, lines 15,16 does suggest projecting one of two images in the step of generating.

Nakamura et al. does teach selecting one of the plurality of partially overlapping images as a standard image that contains a smallest amount of image distortions among the plurality of partially overlapping images. Nakamura selects one image (The image of fig. 13A) from a plurality (The images from fig. 13A and 13B) that are overlapping images as a standard image because the selected image will provide correction of parallax (mentioned in col. 24, lines 40-52) that contains the fewest or smallest amount of parallax distortions as mentioned in Nakamura et al., col. 24, lines 47-52.

Regarding claims 7 and 9 of the instant application, the copending application 09/645,511 teaches in claim 11 all the limitations of claims 7 and 9 of the instant application except for an apparatus comprising a standard image-setting unit.

However, the copending application of claim 11, lines 15,16 does suggest generating one of two images in the apparatus comprising a distortion correction means.

Nakamura et al. does teach selecting one of the plurality of partially overlapping images as a standard image that contains a smallest amount of image distortions among the plurality of partially overlapping images as addressed in claim 6 whose image distortions are to be corrected as addressed in claim 1.

Regarding claims 15 and 16 of the instant application, the copending application 09/645,511 teaches in claim 18 all the limitations of claims 15 and 16 of the instant application except for the limitation "to select" of the second program means of claims 15 and 16.

However, the copending application of claim 18, lines 19,20 does suggest generating one of two images in the fourth program means.

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the image-projecting step of copending Application No. 09/645,511 with the teaching of Nakamura et al.'s teaching of selecting an image based on a optimum joint line, because Nakamura et al.'s image selection based on joint lines provides "...few portions having considerably different parallaxes [that] are jointed and the joint picture image looks more natural than in the conventional technology by which the quality is promoted (Nakamura et al. col. 24, lines 47-52)."

This is a provisional obviousness-type double patenting rejection.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Peleg et al. (US Patent 6,532,036 B1) is pertinent as teaching a method of selecting an image for creating a panoramic image as mentioned in col. 8, lines 57-59.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Rosario-Vasquez whose telephone number is 703-305-5431. The examiner can normally be reached on 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Boudreau can be reached on 703-305-4706. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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